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PATENT

In re Application of Alfred S. Gates, Jr. et al.)
Serial No. 10/799,827) Art Unit 1775
Filed: March 12, 2004) Examiner: Turner, Archene A.

RESPONSE TO NON-FINAL OFFICE ACTION OF SEPTEMBER 24, 2007

REMARKS

Introduction

This paper is fully responsive to the issues raised by the pending Office Action mailed on September 24, 2007. Via this response, applicants have persuasively pointed out the merits of the claims and the reasons supportive of the allowance thereof.

For example, much of the argument for the rejections finds it basis in an allegedly inherent teaching of the reference. Yet, per MPEP 2112, these references present insufficient disclosure to establish inherency with respect to the claims. Further, the references do not address limitations such as, for example, the base coating layer that comprises alumina (see claims 7, 14, 21 and 29).

Applicants submit that the pending claims are allowable over the references of record, and solicit the issuance of a Notice of Allowance and Issue Fee Due and Notice of Allowability.

Rejection under 35 USC §112 ¶2nd

Per Paragraphs 1 and 2, the Primary Examiner rejected claim 7 because it allegedly is unclear in light of the amendment to claim 1. Claim 1 calls for "a base coating layer" and claim 7 merely recites "the base coating layer comprising alumina". Applicants believe that claim 7 is definite, and request the removal of the rejection.

Rejections under 35 USC §102(b)/(e)[1]

Paragraph 4 – Rejection of Claims 1, 4-6, 8, 11, 29 and 31

The Primary Examiner rejects under 35 USC §102(e) claims 1, 4-6, 8, 11, 29 and 31 as being anticipated by U.S. Patent No. 7,163,735 to Ruppi. Applicants respectfully submit that the claims are patentable over '735 Ruppi because '735 Ruppi does not address each and

[1] Paragraph 3 of the Office Action sets forth the statutory basis for the rejections of Paragraphs 4, 5 and 6.

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every limitation. See In re Buszard, Appeal No. 06-1489 (Fed. Cir. 2007) in which the Federal Circuit wrote (Slip Opinion at page 4):

> "A rejection for anticipation under section 102 requires that each and every limitation of the claimed invention be disclosed in a single prior art reference." In re Paulsen, 30 F.3d 1475, 1478-79 (Fed. Cir. 1994); see Karsten Manufacturing Corp. v. Cleveland Golf Co., 242 F.3d 1376, 1383 (Fed. Cir. 2001) ("Invalidity on the ground of 'anticipation' requires lack of novelty of the invention as claimed. . . . that is, all of the elements and limitations of the claim must be shown in a single prior reference, arranged as in the claim.").

In reference to '735 Ruppi, the principal focus is on a coating scheme that includes an α- Al_2O_3 coating layer with a strong texture in the (112) direction. See Col. 3, lines 8-14. In one version of the coating scheme of '735 Ruppi, the layer next to the substrate is a "first layer".[2] In an alternative, a TiN layer is between the substrate and the "first layer" (see Col. 4, lines 41-43). An α- Al_2O_3 layer is on the first layer (see Col. 4, lines 32-34) and in one version is the uppermost layer (see Col. 4, lines 44-45), or in an alternative, a layer is on the α- Al_2O_3 layer (see Col. 4, lines 46-51). As still another alternative, a layer of κ- Al_2O_3 or γ- Al_2O_3 may be on top of the α- Al_2O_3 layer (see Col. 4, lines 52-54).

In claim 1, the alpha-alumina coating layer is on a modification coating layer.[3] The modification coating layer is, "... applied by chemical vapor deposition wherein the modification coating layer includes oxygen and aluminum and one or more of carbon and nitrogen and one or more of the Group IVB elements of the Periodic Table; ...". In '735

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[2] '735 Ruppi describes the "first layer" at Col. 4, lines 27-31:

> The coating comprises a first layer adjacent the substrate of CVD Ti(C,N), CVD TiN, CVD TiC, MTCVD Ti(C,N), MTCVD Zr(C,N), MTCVD Ti(B,C,N), CVD HfN or combinations thereof, and is preferably of Ti(C,N) having a thickness of from 1 to 20 μm, preferably from 1 to 10 μm.

[3] Claims 1 reads [in part], "...the alpha-alumina coating layer being applied on the modification coating layer; ...".

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Ruppi, the disclosure about the first layer, which is the layer on which the Al_2O_3 can be applied, does not teach[4] the above modification coating layer of claim 1.

Further, '735 Ruppi does not address the limitation that the alpha-alumina coating layer has a platelet grain morphology because it does not inherently teach such a morphology. In regard to the α-Al_2O_3 coating, '735 Ruppi discloses the deposition of the α-Al_2O_3 coating at pressures varying between 50-210 mbar at a temperature of 1000 °C and with gases somewhat different from Inventive Heat No. 1.[5] MPEP 2112 IV[6] makes it clear that it is not

[4] Although the text at Col. 4, lines 27-31 identifies a number of materials, none of these materials contains aluminum and the other elements of the modification coating layer per claim 1.

[5] Inventive Heat No. 1 produces the alpha-alumina coating layer with the claimed morphology and includes N_2 and CO as gases. See Paragraph [022] and Table 1-1 at page 14. These gases are absent from Example 1 (coating a) of '735 Ruppi.

[6] It is not an easy task to establish that a document has an inherent disclosure of a claim limitation. MPEP 2112 IV (Rev. 6 Sept 2007) pages 2100-47 through 2100-48 reads [in part]:

> The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (reversed rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art); *In re Oelrich*, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981). "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.' " *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted) ... >Also, "[a]n invitation to investigate is not an inherent disclosure" where a prior art reference "discloses no more than a broad genus of potential applications of its discoveries." *Metabolite Labs., Inc. v. Lab. Corp. of Am. Holdings*, 370 F.3d 1354, 1367, 71 USPQ2d 1081, 1091 (Fed. Cir. 2004) (explaining that "[a] prior art reference that discloses a genus still does not inherently disclose all species within that broad category" but must be examined to see if a disclosure of the claimed species has been made or whether the prior art reference merely invites further experimentation to find the species.<
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> "In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art."

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an easy task to establish that a document has an inherent disclosure of a claim limitation. In light of the differences in pressure, gases and temperature between '735 Ruppi and Inventive Heat No. 1, '735 Ruppi is insufficient to establish any inherent teaching consistent with the guidance by MPEP 2112

What this means is that '735 Ruppi cannot anticipate claim 1, as well as claims 4-6 and 31, which depend in one form or another from claim 1.

Claim 8 calls for, "...a kappa-alumina coating layer that exhibits either a lenticular grain morphology or a polyhedra-lenticular grain morphology at the surface of the kappa-alumina coating layer." All that '735 Ruppi does vis-à-vis a kappa-alumina coating layer is mention that kappa-alumina may be on top of the alpha-alumina layer.[7] This disclosure is not of the kind that provides any guidance as to the morphology of the κ-Al_2O_3 layer. It is speculative for the Primary Examiner to assert that the mere mention of a κ-Al_2O_3 layer addresses the claimed layer with the claimed morphology. Hence, '735 Ruppi cannot anticipate claim 8, as well as claim 11, which depends from claim 8.

Claim 29 calls for, "...the coating scheme further includes a base coating layer of alumina applied to the substrate." According to '735 Ruppi, either the "first layer" (see Col. 4, lines 27-31) or the TiN (see Col. 4, lines 41-43) is on the substrate. There is nothing in '735 Ruppi that addresses this aspect of claim 29, i.e., the base coating layer comprises alumina, so that '735 Ruppi cannot anticipate claim 29.[8]

Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original). ...

[7] At Col. 4, lines 52-54, '735 Ruppi reads:

> In yet another embodiment the coating includes a layer of κ-Al_2O_3 and/or γ-Al_2O_3, preferably atop the α-Al_2O_3, with a thickness of from 0.5 to 10 μm, preferably from 1 to 5 μm.

[8] Applicants point out that consistent with the argument supportive of claim 1, '735 Ruppi does not address the alpha-alumina coating layer with platelet grain morphology. Based on arguments consistent with the argument supportive of claim 8, '735 Ruppi does not address the kappa-alumina coating layer with the recited morphology. The inability of '735 Ruppi to address the alpha-alumina and the kappa-alumina layer supports applicants' position that '735 Ruppi does not address the kappa-

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Overall, there does not appear to be any persuasive teaching in '735 Ruppi that supports the rejection that '735 Ruppi fully anticipates these claims. Applicants request the removal of the rejection and the allowance of the claims.

Paragraph 5 – Rejection of Claims 1-6, 8-14, and 22-25

The Primary Examiner rejects under 35 USC §102(b) claims 1-6[9], 8-14, and 22-25 as being anticipated by the article to Vuorinen et al. Applicants respectfully submit that the claims are patentable over Vuorinen et al. because Vuorinen et al. does not address each and every limitation. See In re Buszard, supra.

Vuorinen et al. discloses an alumina coating scheme that includes α-alumina alone, κ-alumina alone, α+κ alumina or multiple layers of α-alumina and/or κ-alumina (p. 536). According to Vuorinen et al., the goal is the, "[C]ontrol of nucleation and the Al_2O_3 polymorph could be obtained by applying intermediate layers of different chemical compositions, referred to as bonding and modification layers." See p. 536. The alumina is on a layer of (Ti, Al)(C, O), which is on an intermediate layer of TiC.

In reference to the morphology of the alumina layers: α-alumina is relatively equi-axed (p. 538 and Fig. 4(a)), κ-alumina is of a small grain size (p. 539) that is columnar in shape with the growth along the CVD growth direction (p. 540 and FIG. 4(b)), and the α+κ-alumina is faceted (p. 542).

Claim 1 calls for, "...an alpha-alumina coating layer that exhibits a platelet grain morphology at the surface of the alpha-alumina coating layer ...". FIG. 4 of the present application shows the platelet grain morphology of the alpha-alumina coating layer, and that it is not equi-axed such as described by Vuorinen et al.

Further, claim 1 calls for an intermediate layer of a carbonitride of one or more of the Group IVB elements which is applied to a base coating layer on the substrate. A coating

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alpha alumina coating layer. Thus, in addition to not addressing the alumina base coating layer, '735 Ruppi does not address any one of the alumina coating layers.

[9] Since claim 3 stands cancelled, this rejection should impact claims 1, 2 and 4-6.

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layer like the claimed intermediate coating layer is absent from Vuorinen et al. Specifically, in Vuorinen et al., the (Ti, Al)(C,O) layer is on a TiC layer and not a carbonitride layer.

The apparent difference in the morphology and the absence of the intermediate coating layer from Vuorinen et al. supports applicants' argument that Vuorinen et al. cannot anticipate claim 1. Claims 2, and 4-6 depend there from in one way or another from claim 1, and hence, are patentable over Vuorinen et al. for the same reasons as advanced in support of claim 1.

Claim 8 calls for, "...a kappa-alumina coating layer that exhibits either a lenticular grain morphology or a polyhedra-lenticular grain morphology at the surface of the kappa-alumina coating layer." FIG. 9 shows the kappa-alumina polyhedra-lenticular grain morphology. See Paragraph [027]. FIG. 13 shows the lenticular grain morphology. See Paragraph [031]. The morphologies of these figures do not appear to be columnar so that the small grain size columnar grain structure of the κ-alumina of Vuorinen et al. is not like that of claim 8. Hence, Vuorinen et al. cannot anticipate claim 8, as well as claims 9-14, which depend in one form or another from claim 8.

Further, claim 10 calls for the intermediate layer of carbonitride, which is absent from Vuorinen et al. Hence, on this basis, Vuorinen et al. cannot anticipate claim 10. Also, claim 14 calls for an alumina base layer, which is absent from Vuorinen et al. Hence, on this basis, Vuorinen et al. cannot anticipate claim 14.

In reference to claim 22, Vuorinen et al. does not disclose the deposition temperature[10] so it cannot anticipate claim 22. Further, for reasons like those advanced in support of claim 1, Vuorinen et al. cannot address the alpha-alumina layer per the claim. For reasons like those advanced in support of claim 8, Vuorinen et al. cannot address the kappa-alumina layer per the claim. The inability of Vuorinen et al. to address either alpha-alumina or kappa-alumina coating layers supports the argument that Vuorinen et al. cannot address the kappa-alpha alumina coating layer.

[10] It appears that the only reference to the temperature is at page 537, which reads, "The deposition parameters (gas composition, pressure, temperature, total flow rate) were kept identical for the experimental coatings investigated."

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Overall, for the above reasons, applicants submit that Vuorinen et al. cannot anticipate claim 22. In addition, applicants submit that dependent claims 23-25, which depend from claim 22, are allowable for the reasons advanced in support of claim 22.

Paragraph 6 – Rejection of Claims 8-9, 11-13, and 22-24

The Primary Examiner rejects under 35 USC §102(b) claims 8-9, 11-13, and 22-24 as being anticipated by U.S. Patent No. 6,565,957 to Nakamura et al. Applicants respectfully submit that the claims are patentable over '957 Nakamura et al. because '957 Nakamura et al. does not disclose each and every limitation. See In re Buszard, supra.

'957 Nakamura et al. discloses the deposition of an α-Al_2O_3 coating layer and a κ-Al_2O_3 coating layer; however, the emphasis is on the κ- Al_2O_3 coating (see Col. 3, lines 44-54). The Al_2O_3 coating layer is deposited via CVD on a PVD hard coating layer (TiN or (Ti, Al)N). See Col. 3, lines 11-17. There does not appear any disclosure as to the morphology of the Al_2O_3 layers (including κ- Al_2O_3) of '957 Nakamura et al.[1] '957 Nakamura et al. does not present a disclosure that would establish inherency with respect to the morphology per the claims.

In this regard, ***claim 8*** calls for, "...a kappa-alumina coating layer that exhibits either a lenticular grain morphology or a polyhedra-lenticular grain morphology at the surface of the kappa-alumina coating layer." FIGS. 9 and 13 of the present application shows these two morphologies as discussed above. Each one of Inventive Heat Nos. 5 (FIG. 9) and 8 (FIG.

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[1] At Col. 3, lines 45-54, '957 Nakamura et al. describes the κ- Al_2O_3 layer, which is the preferred layer based upon testing (see Col. 3, lines 18-24):

> (C) When the Al_2O_3 layer which has mainly a .kappa.-type crystal structure (hereinafter referred to as κ- Al_2O_3) is formed by chemical vapor deposition at a middle temperature such as 750-850°C., the produced κ- Al_2O_3 layer has extremely high hardness at high temperature, so the hard coating layer which has the above-mentioned κ- Al_2O_3 layer as an outer layer possesses further excellent high temperature strength and hardness. Therefore, the coated cutting tool having this structure has a superior cutting performance.

There does not appear to be any detailed description of the morphology.

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13) includes the step of depositing alumina on a modification coating layer of titanium aluminum oxycarbonitride.[12] The first two processes in Table 6 produce a κ-Al_2O_3 coating; however, $(Ti_{1-x}Al_x)N$ or other materials (see Table 7) different from titanium aluminum oxycarbonitride comprise the inner layer on which κ-Al_2O_3 is applied. $(Ti_{1-x}Al_x)N$, as well as the inner layers of Examples 1-9 and 14-15 of Table 7, are different from titanium aluminum oxycarbonitride of the present Inventive Heats Nos. 5 and 8. Further, the deposition temperature of Inventive Heats Nos. 5 and 8 is 870-890 °C, which is higher than the temperatures of 800 °C and 750 °C of Table 6. These differences (i.e., the material on which alumina is applied and the deposition temperatures) raise a strong challenge to any argument that '957 Nakamura et al. inherently addresses the specific morphology of the kappa-alumina coating layer of claim 8. This is especially the case when the composition of the layer on which alumina is applied impacts the as-applied alumina coating. In this regard, Vuorinen et al. states that the layer on which alumina is applied impacts the polymorph of alumina (see page 536).

While '957 Nakamura et al. discloses a κ- Al_2O_3 coating, there is no inherent teaching as to the morphology. Thus, '957 Nakamura et al. cannot anticipate claim 8. Claims 9 and 11-13 depend from claim 8 and are not anticipated by '957 Nakamura et al. for the same reasons.

Claim 22 calls for:

> ...an alumina coating layer selected from the group comprising an alpha-alumina coating layer having a platelet grain morphology at the surface thereof and a kappa-alumina coating layer having either a lenticular grain morphology at the surface thereof or a polyhedra-lenticular grain morphology at the surface thereof and a kappa-alpha-alumina coating layer having either a large multifaceted grain morphology at the surface thereof or a polyhedra-multifacted grain morphology at the surface thereof, ...

[12] Inventive Heat No. 5 is like Inventive Heat No. 3. See Paragraph [072]. See Table 2 for Inventive Heat No. 3. See Table 7 for Inventive Heat No. 8.

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The absence of a teaching of this limitation results in '957 Nakamura et al. not anticipating claim 22.

More specifically, in reference to the alpha-alumina coating layer, the third and fourth examples in Table 6 (see Col. 13) indicate the application of α-Al_2O_3 alumina. Inventive Heat No. 1 of the present application uses a modification coating layer of titanium aluminum oxycarbonitride. This layer is different from the inner layers of Examples 10-13 of Table 7 on which the α-Al_2O_3 coating is applied. Further, the deposition temperature of Inventive Heat No. 1 is 870-890 °C, which is higher than the temperature of 850°C as set out in Table 6. In light of the guidance provided by MPEP 2112, these differences raise a strong challenge to any argument that '957 Nakamura et al. inherently addresses the specific morphology of the alpha-alumina layer.

In reference to the kappa alumina coating layer, the arguments are the same as those made against '957 Nakamura et al. in support of claim 8, and applicants reiterate the same herein. In light of the nature of the disclosure of the α- Al_2O_3 layer and the κ- Al_2O_3 layer, applicants submit that '957 Nakamura et al. cannot anticipate the alpha-kappa-alumina coating layer with the morphology per claim 22.

What this means is that '957 Nakamura et al. cannot anticipate claim 22. It follows then that claims 23-24, which depend from claim 22, are not anticipated by '957 Nakamura et al. for the same reasons supportive of claim 22.

Rejections under 35 USC §103(a)[13]

Paragraph 8 – Rejection of Claims 1, 2, 4-6, and 15-25

The Primary Examiner rejects claims 1, 2, 4-6, and 15-25 as being obvious over U.S. Patent No. 6,333,103 to Ishii et al. in view of '735 Ruppi or Vuorinen et al. Applicants submit that the above combination does not render the claims obvious.

[13] Applicants submit that the rejections under 35 USC §103(a) do not present the formal Graham v. Deere analysis per the recent Guidelines (see Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103 In View of the Supreme Court Decision in KSR International Co. v. Teleflex Inc., Federal Register Vol. 72 No. 195 pages 57526-57353).

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'103 Ishii et al., the principal document[14] applied in this rejection, discloses that the alumina layer is on a "first layer" which comprises (see Col. 7, lines 43-49):

> The first coating layer may be formed on a surface of the substrate by depositing at least one selected from the group consisting of carbides, nitrides, carbonitrides, oxides, oxycarbides, oxynitrides and oxycarbonitrides of metals in Groups IVa, Va and VIa of the Periodic Table preferably at 950 to 1020°C. for 5 to 60 minutes by a film-forming method such as a chemical vapor deposition (CVD), a plasma-assisted chemical vapor deposition (PACVD), etc.

An exemplary "first layer" is TiCO. See Col. 7, lines 53-54. In reference to the alumina, there are general statements that identify phases such as α-aluminum oxide and κ-aluminum oxide, but there is no reference to specific morphologies of any of these crystalline phases (see Col. 8, lines 24-35):

> The aluminum oxide is not restricted to α-aluminum oxide only, but may be a mixture of α-aluminum oxide with other aluminum oxides such as κ-aluminum oxide, γ-aluminum oxide, θ-aluminum oxide, δ-aluminum oxide, χ.-aluminum oxide, etc., or a mixture of α-aluminum oxide with other oxides such as zirconium oxide, etc., as long as a major component of the aluminum oxide layer is α-aluminum oxide. Thus, the term " α-aluminum oxide-based oxide layer" used herein means an oxide layer based on α-aluminum oxide, 60% or more of the total of X-ray diffraction peaks being derived from those of α-aluminum oxide.

In reference to claim 1, it is clear that '103 Ishii et al. does not address the recitation that the alpha aluminum coating layer has the platelet grain morphology. The disclosure of a general statement of crystalline phases of alumina cannot inherently disclose the claimed

[14] Applicants described and discussed the secondary documents, i.e., '735 Ruppi and Vuorinen et al., above. Heretofore, applicant argued against the use of these secondary documents as anticipatory references.

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morphology. This is especially the case in light of the higher deposition temperature (i.e., 1000-1050 °C). See Col. 8, lines 57-63.

'735 Ruppi does not address this deficiency in '103 Ishii et al. for the reasons as argued earlier with regard to claim 1 (see argument against the rejection per Paragraph 4 of the Office Action). Vuorinen et al. does not address this deficiency in '103 Ishii et al. for the reasons as argued earlier with regard to claim 1 (see argument against the rejection per Paragraph 5 of the Office Action).

The "bottom line" is that '103 Ishii et al. lacks a teaching (i.e., the alpha alumina with a platelet grain morphology) that is also lacking in '735 Ruppi and Vuorinen et al. Thus, the combination cannot render claim 1, and its dependent claims 2 and 4-6, obvious.

In reference to claim 15, '103 Ishii et al. does not contain a disclosure of the morphology that, "...a kappa-alpha alumina coating layer that contains alpha-alumina and kappa-alumina, and wherein the kappa-alpha coating layer exhibits either a large multifaceted grain morphology or a polyhedra-multifaceted grain morphology at the surface of the alumina coating layer." As set out above, the disclosure of only a general statement about crystalline phases of alumina (see Col. 8, lines 24-35) taken together with (1) a "first layer" different from the modification layer, and (2) the higher deposition temperatures (1000-1050 °C), as compared to Inventive Heats Nos. 2 (Table 1 at page 19) and 4 (Table 3 at page 23), presents a strong case against any inherent teaching so that '103 Ishii et al. cannot address the kappa-alpha alumina coating layer.

'735 Ruppi does not add any disclosure to help the combination to address these claims. More specifically, '735 Ruppi does not address the kappa crystalline phase of alumina. The inability of '735 Ruppi to address the kappa alumina leads to a conclusion that it cannot address the kappa-alpha alumina coating layer.

Vuorinen et al. does not add any disclosure to help the combination to address these claims. More specifically, a general statement in Vuorinen et al. about an $\alpha+\kappa$ alumina layer does not rise to the level of disclosure of the kappa-alpha alumina coating layer with the specific morphology.

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Claims 16-21 depend in one way or another from claim 1, and hence, are allowable for the reasons advanced in support of claim 15. Further, claim 21 calls for the alumina base coating layer absent from '103 Ishii et al., as well as '735 Ruppi or Vuorinen et al.

Claim 22 calls for morphologies of the alumina layer are not disclosed by '103 Ishii et al. More specifically, the above arguments establish that '103 Ishii et al. does not disclose the alpha alumina with platelet grain morphology or the kappa alumina with its morphology. There is nothing that would cause '103 Ishii et al. to address the kappa-alpha alumina coating when it is deficient with respect to the alpha-alumina and the kappa-alumina.

'735 Ruppi does not address the deficiencies in '103 Ishii et al. vis-à-vis these claims. More specifically, as argued above, '735 Ruppi does not address the alpha-alumina with the platelet grain morphology (see the argument supportive of claim 1) and '735 Ruppi does not disclose the kappa-alumina (see the argument supportive of claim 8) or the kappa-alpha alumina coating layers with their specific morphologies.[15]

Vuorinen et al. does not address the deficiencies in '103 Ishii et al. vis-à-vis these claims. More specifically, as argued above, Vuorinen et al. does not address the alpha-alumina with the platelet grain morphology and Vuorinen et al. does not disclose the kappa-alumina or the kappa-alpha alumina coating layers with their specific morphologies.

Applicants submit that this combination cannot render claim 22 obvious. In addition, Claims 23-25 depend from claim 22, and hence, are allowable for the reasons advanced in support of claim 22.

Paragraph 9 – Rejection of Claims 14 and 21

The Primary Examiner rejects claims 14 and 21 as being obvious over Ishii et al. in view of U.S. Patent No. 6,689,450 to Ruppi. Applicants submit that this rejection is without merit for the reasons set forth below.

Claim 14 depends from claim 8, and hence, is allowable for the reasons advanced in support of claim 8. Further, claim 14 calls for, "... a base coating layer of alumina on the

[15] The absence of any basis to argue that '735 Ruppi addresses alpha-alumina or kappa-alumina mandates that '735 Ruppi cannot address the kappa-alpha-alumina coating.

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substrate." '450 Ruppi discloses multiple layers of alumina, but it does not show a base coating layer on the substrate that is alumina. Thus, the combination of '103 Ishii et al., and '450 Ruppi cannot render claim 14 obvious.

Claim 21 depends from claim 15, and hence, is allowable for the reasons advanced in support of claim 15. Further, claim 21 calls for, "... a base coating layer of alumina on the substrate." '450 Ruppi discloses multiple layers of alumina, but it does not show a base coating layer on the substrate that is alumina. Thus, the combination of '103 Ishii et al., and '450 Ruppi cannot render claim 21 obvious.

Conclusion

Applicants submit that the claims define allowable subject matter. Applicants solicit the issuance of a Notice of Allowance and Issue Fee Due and Notice of Allowability. If the Examiner disagrees with the arguments, but has suggestions to place the claims in form for allowance, applicants urge the Examiner to contact the undersigned (615 662 0100) or Mr. John J. Prizzi, Esq. (724 539 5331) to discuss the case.

Respectfully submitted,

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